LISTING OF CLAIMS

No claims are amended herein.

1. (Original) A quaternary or higher group IB-IIIA-VIA alloy having the general formula (I):

$$A(B_{1-x}C_x)(D_{1-y}E_y)_2 \ldots\ldots \text{(I)}$$

wherein:

A is a group IB element;

B is a group IIIA element;

C is a group IIIA element, which is different to B;

D is a first group VIA element (hereinafter referred to as VIA_1);

E is a second group VIA element (hereinafter referred to as VIA_2); and

each of x and y independently are from 0 to 1, provided that both x and y are not zero at the same time;

and the alloy being characterized by an x-ray diffraction pattern (XRD) having a main [112] peak at a 2θ angle ($2\theta_{(112)}$) of from 26° to 28° for Cu radiation at 40kV, wherein a glancing incidence x ray diffraction pattern (GIXRD) for a glancing angle of from 0.2° to 10° reflects an absolute shift in the $2\theta_{(112)}$ angle of less than 0.06°.

2. (Original) The alloy of Claim 1, wherein the alloy has a crystal structure comprising a lattice of unit cells, wherein all crystallographic planes of the unit cells show a variance in d-spacing of less than 0.01Å.

3. (Original) The alloy of claim 1, wherein the element concentration of elements A, B, C, D, and E, as characterized by XPS depth profiling, is substantially uniform through the alloy.

4. (Original) The alloy of claim 1, wherein A is Cu, B is In, C is Ga, D is Se and E is S, the alloy having a formula (II):

$$Cu(In_{1-x}Ga_x)(Se_{1-y}S_y)_2 \ldots\ldots \text{(II)}$$

5. (Original) The alloy of claim 4, wherein x is from 0.25 to 0.3 and y is from 0.05 to 0.8.

6. (Original) The alloy of claim 4, wherein the x-ray diffraction pattern (XRD) has a main [112] peak at a 2θ angle ($2\theta_{(112)}$) of from 26.9° to 28° for Cu radiation at 40kV, taken at a d-spacing of from 3.3117Å to 3.1840Å.

7. (Original) The alloy of claim 4, wherein the GIXRD for a glancing angle of from 0.2° to 10° reflects an absolute shift in the $2\theta_{(112)}$ angle of less than 0.01°.

8. (Original) The alloy of claim 4, wherein the alloy has a crystal structure comprising a lattice of unit cells, wherein all crystallographic planes of the unit cells show a variance in d-spacing of less than 0.001Å.

9. (Original) The alloy of claim 6, wherein the main [112] peak is from a 2θ angle of from 27.0° to 27.5°.

10. (Original) The alloy of claim 6, wherein the main [112] peak is substantially symmetrical.

11. (Original) The alloy of claim 4, wherein the alloy has a band gap that can be shifted from 1 eV to 2.4 eV.

12. (Original) The alloy of claim 11, wherein the alloy has a band gap that can be shifted from 1.1 eV to 1.5 eV.

13. (Original) The alloy of claim 4, wherein the S content, as expressed by the molar ratio of $\frac{S}{(S+Se)}$, is from 0.05 to 0.7.

14. (Withdrawn) The alloy of claim 1, wherein A is Cu, B is In, C is Ga, D is Se and y = 0, the alloy having the general formula (III)

$$Cu(In_{1-x}Ga_x)Se_2 \ldots\ldots \text{(III)}$$

15. (Withdrawn) The alloy of claim 14, wherein x is from 0.25 and 0.3.

16. (Withdrawn) The alloy of claim 14, wherein the alloy has a crystal structure comprising a lattice of unit cells, wherein all crystallographic planes of the unit cells show a variance in d-spacing of less than 0.006Å.

17. (Withdrawn) The alloy of claim 14, wherein the x-ray diffraction pattern (XRD) has a main [112] peak at a 2θ angle ($2\theta_{(112)}$) of from 26.80° to 27.0° for Cu radiation at 40kV, taken at a d-spacing of from 3.3236Å to 3.2990Å.

18. (Withdrawn) The alloy of claim 14, wherein the GIXRD for a glancing angle of from 0.2° to 10° reflects an absolute shift in the $2\theta_{(112)}$ angle of less than 0.05°.

19. (Withdrawn) The alloy of claim 17, wherein the main (112] peak lies from a 2θ angle of from 26.85° to 26.9°.

20. (Withdrawn) The alloy of claim 17, wherein the main (112] peak is substantially symmetrical.

21. (Withdrawn) The alloy of claim 14, wherein the alloy has a band gap which can be shifted from 1.1 eV to 1.2 eV.

22. (Withdrawn) The alloy of claim 21, wherein the alloy has a band gap which can be shifted from 1.15 eV to 1.18 eV.

23. (Withdrawn) The alloy of claim 14, wherein the Ga content, as expressed by the molar ratio of $\frac{Ga}{(Ga+In)}$ is from 0.25 to 0.3.

24. (Withdrawn) The alloy of claim 1, wherein A is Cu, B is In, D is Se, E is S and X = 0 and has the general formula (IV):

$$CuIn(Se_{1-y}S_y)_2 \ldots\ldots \text{(IV)}$$

25. (Withdrawn) The alloy of claim 24, wherein y is from 0.1 and 0.5.

26. (Withdrawn) The alloy of claim 24, wherein the alloy has a crystal structure comprising a lattice of unit cells, wherein all crystallographic planes of the unit cells show a variance in d-spacing of less than 0.007Å.

27. (Withdrawn) The alloy of claim 24, wherein the x-ray diffraction pattern (XRD) has a main (112] peak at a 2θ angle ($2\theta_{(112)}$) of from 26.80° to 27.3° for Cu radiation at 40kV, taken at a d-spacing of from 3.3236Å to 3.2640Å.

28. (Withdrawn) The alloy of claim 24, wherein the GIXRD for a glancing angle of from 0.2° to 10° reflects an absolute shift in the $2\theta_{(112)}$ angle of less than 0.06°.

29. (Withdrawn) The alloy of claim 27, wherein the main (112] peak lies from a 2θ angle of from 27.0° to 27.2°.

30. (Withdrawn) The alloy of claim 24, wherein the alloy has a band gap which can be shifted from 1.05 eV to 1.23 eV.

31. (Withdrawn) The alloy of claim 30, wherein the alloy has a band gap which can be shifted from 1.15 eV to 1.20 eV.

32. (Withdrawn) The alloy of claim 24, wherein the S content, as expressed by the ratio of $\frac{S}{(S+Se)}$ lies from 0.1 and 0.5.

33. (Withdrawn) A semiconductor film comprising a film of an alloy of claim 1.

34. (Withdrawn) The semiconductor film of claim 33, wherein the alloy of claim 1 is deposited onto a substrate which serves as a support for the alloy.

35. (Withdrawn) The semiconductor film according to claim 33, wherein the alloy is in the form of a film having a thickness of 1.5 to 2.0 μm.

36. (Withdrawn) A photovoltaic cell including a semiconductor film of an alloy of claim 1.

37. (Withdrawn) The photovoltaic cell according to claim 36, wherein the photovoltaic cell has a conversion efficiency of from 8 to 15%.